

REMARKS

Claim Rejections—35 USC § 103 (a)

Claims 1-6, 16-18, and 20-29 stand rejected under 35 USC § 103(a) as being unpatentable over Kinkelaar (US 5,668,191) in view of Humbert (US 6,458,860). In particular, the Examiner asserts that the difference between Kinkelaar and the present claims is the presence of a reactive catalyst. Thus, relying on Humbert the Examiner argues that it would have been obvious for one having ordinary skill in the art to have employed the amine catalysts of Humbert as the amine catalysts in the preparations of Kinkelaar to provide reduced fogging and volatile release in products formed in order to arrive at the processes of the claims at issue with the expectation of success. This argument is respectfully traversed.

To be commercially viable, certain foams may have to meet requirements for low emissions, low odor, and low vinyl staining and they may also have to be "good quality" foams meeting performance criteria/physical properties requirements such as hardness, resilience, tensile, tear, % elongation, compression sets, wet sets, and others. Such good quality foams are achievable with non-reactive catalysts. But foams made with these catalysts tend to have undesirable emissions and odor. Reactive catalysts may cure emissions problems; but the resultant foams tend not to be of good quality. *See, e.g.*, US 2006/0058405 A1 at [0003]. Humbert, a colleague of the present Applicants, found that a particular non-reactive catalyst, JEFFCAT® Z-140 catalyst, helps to minimize emissions from cured foams. *Id.* at [0004]. Particularly, when used in combination with a reactive catalyst, the JEFFCAT® Z-140 catalyst helps prevent fogging such as on the inside of a car window. Humbert at 2:20-55. But these reductions may not be enough to meet newer emission requirements. US 2006/0058405 A1 at [0004]. And so the Applicants continued the investigation finding, to their surprise, that reactive catalysts in combination with certain polyols produced low-emission, good

quality foams. A particular unexpected improvement was in humid aged properties. *See, e.g.*, US 2006/0058405 A1 examples 1-3.

For example, referring to Example 1 (control) of the present application, a foam made with a polyol having a higher level of unsaturation (Polyol A) and a blend of non-reactive catalysts had good physical properties (e.g. Compression Set, 50 % of 11.0 and Wet set of 16.7). But when the catalyst was changed to a reactive catalyst blend (Example 2) the physical properties of the resultant foam were poor in comparison (e.g. Compression Set, 50 % of 18.8 and Wet set of 30.7). Surprisingly, when the reactive catalysts were combined with a polyol having a lower level of unsaturation (Example 3, Polyol B), the physical properties of the resultant foam were as good as or better than the foam of Example 1 (e.g. Compression Set, 50 % of 8.6 and Wet set of 16.8). Thus, the Applicants were successful at making low-emission foams with good physical qualities using reactive catalysts. See also Applicants Example 7.

There is nothing in the references to cause one of ordinary skill to expect the success of the Applicants. For instance, referring to Humbert's examples, Example 1 is a control sample using two non-reactive catalysts and Examples 4 and 5 are produced with the combination of the particular non-reactive gelling catalyst (N,N-bis-(3-dimethylaminopropyl)-formamide) and a reactive blowing catalyst. Examples 2, 3, and 6, however, are examples of foams made using a reactive gelling catalyst and not the particular non-reactive gelling catalyst. Compared to Examples 1, 4, and 5, the foams of Examples 2, 3, and 6 had increased humid aged compression sets and the wet set tests. Humbert at 5:44-53. Thus, only the foams made with the particular non-reactive gelling catalyst (Examples 4 and 5) were considered by Humbert as having low volatility and good physical properties. *Id.* at 2:50-55 and 5:47-53.

To make his argument, however, the Examiner, explicitly references Humbert's Example 3. In Example 3, two reactive catalysts were used to make a

foam that had poor physical properties compared to the control foam. This result is consistent Humbert's statement that the use of reactive catalysts normally results in some detrimental effect on the physical properties of the resultant foam. Humbert, 2:50-52. Thus, it is respectfully submitted that Humbert teaches away from using reactive catalysts in the absence of N,N-bis-(3-dimethylaminopropyl)formamide, such as in Humbert's Example 3, to make a foam with low emissions and good physical properties.

Given Humbert's teachings, it is submitted that there was no reason for one of ordinary skill in the art to make a foam using Humbert's reactive catalyst (without N,N-bis-(3-dimethylaminopropyl)formamide) in Kinkelaar's preparations and expect a low emission, good quality foam. In particular, Humbert's Example 3 did not provide desirable physical property results. To the extent that the foam of Humbert's Example 3 showed reduced fogging—this is only part of the solution, the resultant foam needs to have good physical properties as well. There is nothing in Humbert that teaches or suggests making a good quality, low emission foam using just reactive catalysts.

Thus, to the extent that Humbert discloses reactive catalyst blends that are identified in the claims, it is respectfully submitted that one of ordinary skill in the art, at the time the invention was made, would not expect to use those reactive catalysts blends and succeed in making polyurethane foams having low emissions and good quality—especially the expectation of the degree of improvement in humid aged properties observed by the Applicants.

For at least these reasons, it is submitted that the Examiner has not established *prima facie* obviousness for any of claims 1-6, 16-18, and 20-29. Reconsideration of each rejection is requested.

Withdrawal of Claim 19

The Examiner's withdrawal of claim 19 is respectfully traversed. The Examiner asserts that claim 19 is directed to an invention that is independent or distinct from

the invention originally claimed. Claim 19, however, depends from claim 18. Because claim 19 is a dependent claim it is not clear how it can be independent from claim 18. Furthermore, because claim 19 is, as claimed, connected to claim 18 it is not clear how it can be distinct. See MPEP §802.1 *Meaning of "Independent" and "Distinct."* That is, claim 18 recites forming a molded flexible polyurethane foam that has a carbon emission of 0.1 or less per gram of foam and claim 19 is directed toward testing that foam for carbon emission. For at least these reasons, reconsideration of the withdrawal of claim 19 is requested.

Conclusion

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the inventions as claimed.

Having addressed all issues set out in the office action, Applicant respectfully submits that the claims are in condition for allowance and respectfully requests that the claims be allowed.

Respectfully submitted,

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